CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 01, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 01, 2014 07:00 to December 02, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. AreaRAE Unit 02 reported three instantaneous detections of H_2S at the sensor detection limit of 1 ppm and were not sustained above site action levels for H_2S. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
December 01, 2014 07:00 – December 02, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	MR+ / MR Pro	25	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	25	0	NA	<1 %
	O_2	MR+ / MR Pro	25	25	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	25	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	25	25	0.013	0.006 - 0.021 mg/m^3
	SO_2	MR+	25	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	25	0	NA	<0.2 mg/m3
	VOC	MR+ / MR Pro	25	0	NA	<0.1 ppm
Exclusion Zone	Cl_2	Gastec 8La	1	0	NA	<0.05 ppm
	H_2S	MR+ / MR Pro	12	0	NA	<1 ppm
	HCl	Gastec 14	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	12	0	NA	<1 %
	O_2	MR+ / MR Pro	12	12	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	2	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	1	1	0.054	0.054 - 0.054 mg/m^3
	SO_2	MR+	12	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	1	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	12	0	NA	<0.1 ppm
Work Area	Cl_2	MR+ / MR Pro	16	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	20	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	14	0	NA	<1 %
	O_2	MR+ / MR Pro	2	2	20.9	20.9 - 20.9 %
	SO_2	MR+	4	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	1	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	20	1	0.3	0.3 - 0.3 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
December 01, 2014, 2014 07:00 – December 02, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5567	343	0.3 ppm	0.1 - 1.0 ppm
	LEL	5567	0	NA	< 1 %
	SO_2	5567	4	0.1 ppm	0.1 - 0.1 ppm
	VOC	5567	11	0.1 ppm	0.1 - 0.2 ppm
Unit 02	H_2S	5337	31	0.1 ppm	0.1 - 0.6 ppm
	LEL	5337	0	NA	< 1 %
	SO_2	5337	0	NA	< 0.1 ppm
	VOC	5337	143	0.3 ppm	0.1 - 2.5 ppm
Unit 03	H_2S	5565	215	0.1 ppm	0.1 - 0.2 ppm
	LEL	5565	0	NA	< 1 %
	SO_2	5565	0	NA	< 0.1 ppm
	VOC	5565	4	0.5 ppm	0.2 - 0.7 ppm
Unit 04	H_2S	5566	160	0.1 ppm	0.1 - 0.2 ppm
	LEL	5566	0	NA	< 1 %
	SO_2	5566	0	NA	< 0.1 ppm
	VOC	5566	9	0.1 ppm	0.1 - 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
December 01, 2014 07:00 – December 01, 2014 21:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10704069	AR01	5217	5140	0.023	0.001 - 0.772 mg/m^3
10704074	AR02	4980	2568	0.008	0.001 - 0.702 mg/m^3
10704072	AR03	5076	5075	0.009	0.001 - 0.826 mg/m^3
10408087	AR04	2205	2200	0.014	0.001 - 0.084 mg/m^3
11005012		489	489	0.03	0.004 - 0.057 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

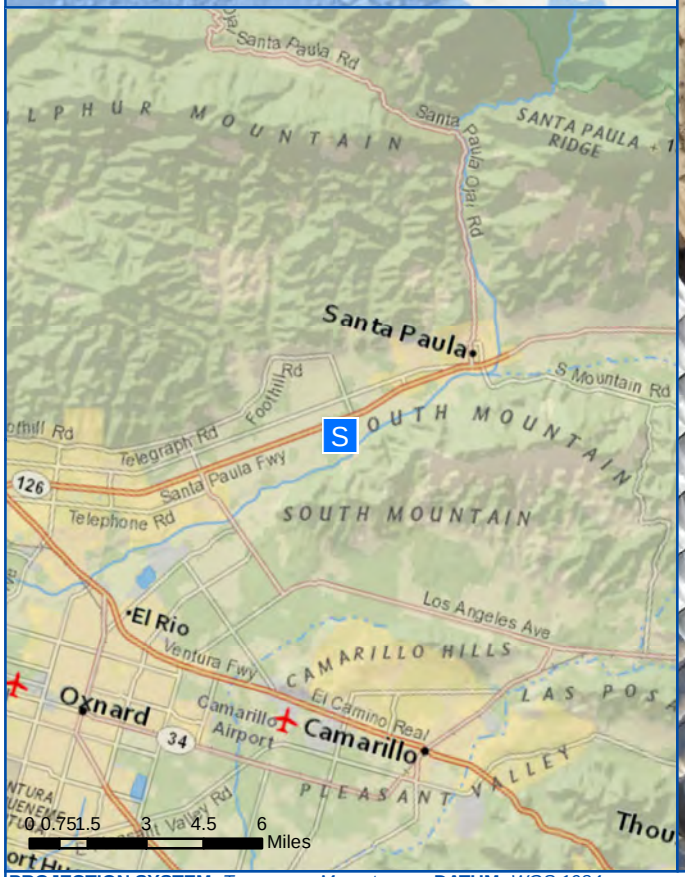
Incident Maps:

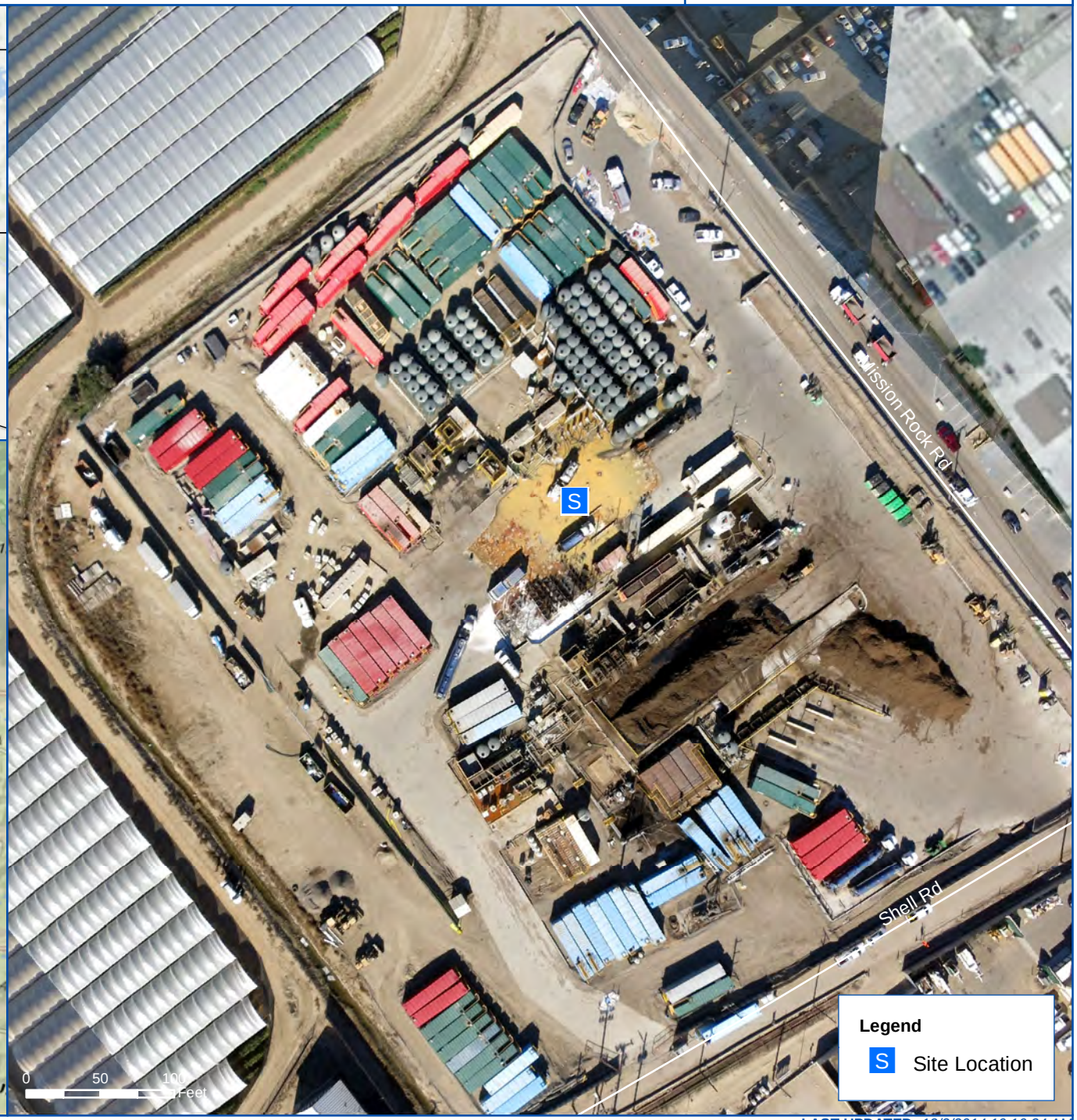
Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura





PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 10:10:34 AM*

Aerial Overview - 12/01/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 12:06:32 PM*

Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 12:22:02 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 11:11:10 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/2/2014 11:09:06 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 11:08:08 AM*

Manually Logged Real-Time Air Monitoring Concentrations

HCl - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/2/2014 12:00:51 PM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/2/2014 11:05:39 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 11:03:55 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 11:02:48 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 10:59:12 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/2/2014 10:58:13 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Dec 01, 2014 07:00 to Dec 02, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/2/2014 10:47:59 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

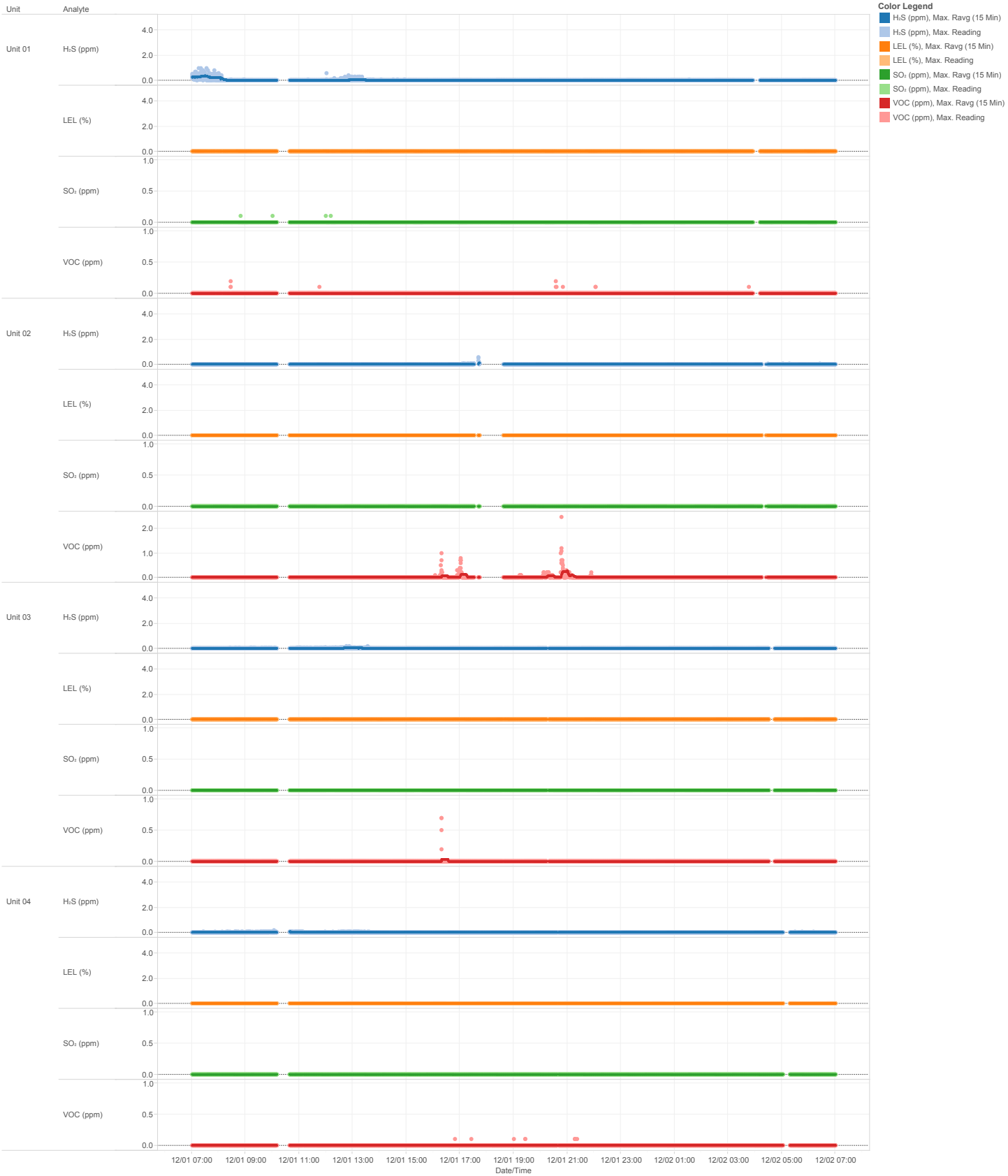
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

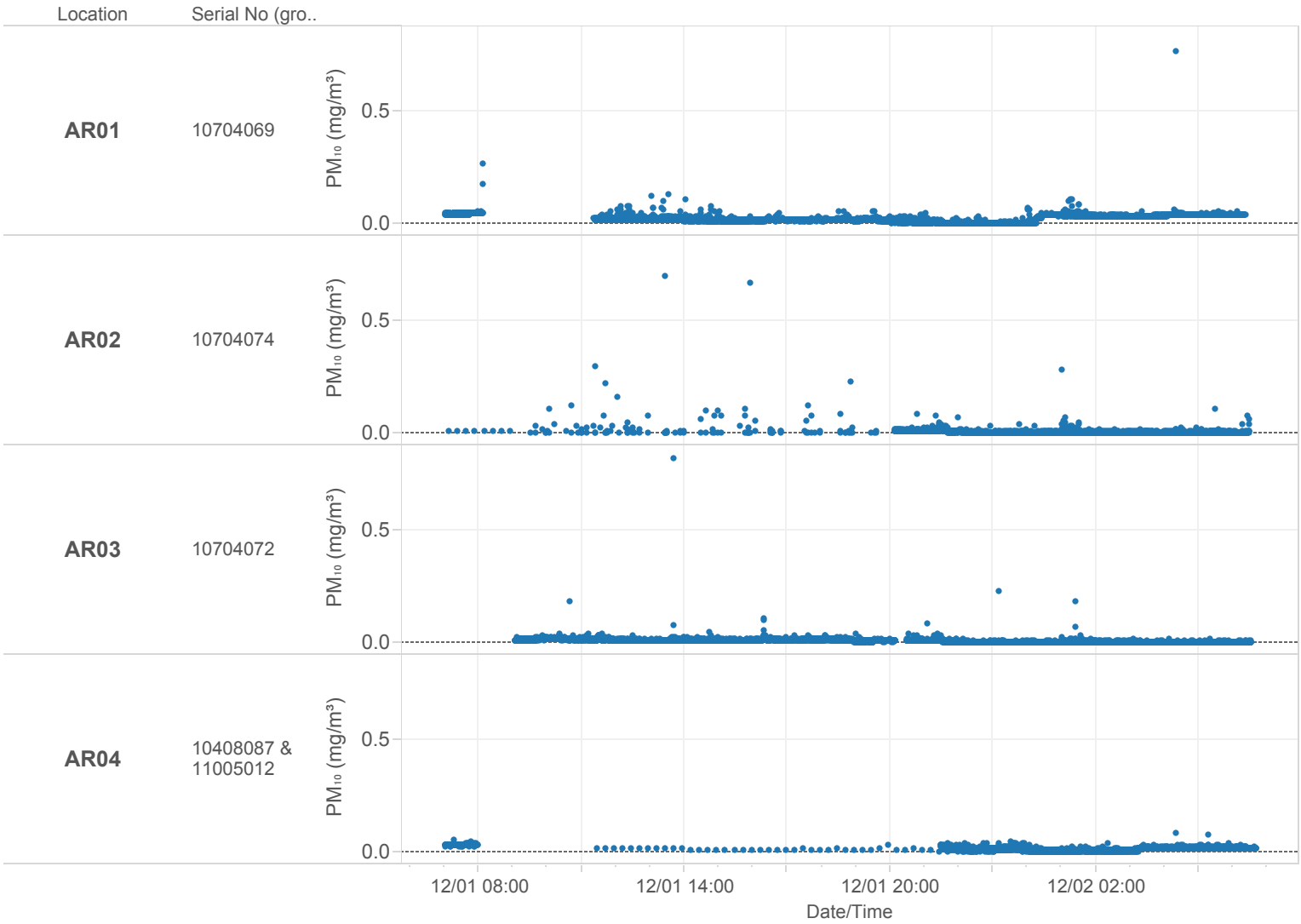
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

Patriot Environmental
AreaRAE Trend Graphs
12/01/2014 07:00 - 12/02/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
12/01/2014 07:00 - 12/02/2014 21:30



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format